

ABSTRACT OF THE DISCLOSURE

A method for processing a semiconductor topography is provided, which includes diffusing deuterium across one or more interfaces of a silicon-oxide-nitride-oxide-silicon (SONOS) structure. In particular, the method may include diffusing deuterium across one or more interfaces of a SONOS structure during a reflow of a dielectric layer spaced above the SONOS structure. In some embodiments, the method may include forming a deutereated nitride layer above the SONOS structure prior to the reflow process. In addition or alternatively, the method may include forming a deutereated nitride layer within the SONOS structure prior to the reflow process. In some cases, the method may further include annealing the SONOS structure with a deutereated substance prior to forming the deutereated nitride layer. In either embodiment, a SONOS structure may be formed which includes deuterium arranged within an interface of a silicon layer and an oxide layer of the structure.

15